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DISCUSSION DOCUMENT AND DRAFT REGULATIONS LANDFILL MINING/RECLAMATION REGULATIONS 310 CMR 19.000

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I. Introduction

The Department of Environmental Protection (DEP) is proposing an addition to the Solid Waste Management Facility Regulations, 310 CMR 19.000, which will set standards for landfill mining and reclamation operations.

All interested parties are encouraged to submit written or oral comments during the public comment period which ends February 7, 1997. During this comment period, DEP will hold public hearings to receive comments (please see enclosed Notification for more information).

To submit written comments or obtain further information, please contact Sean Griffin, Division of Solid Waste Management, Boston 02108 or phone (617) 292-5967.

II. Summary of Landfill Mining Regulations

Introduction.

Landfill mining is defined as the process of excavating solid waste from an existing landfill. The purpose for mining may be to remove the waste in order to remediate a site, to reduce closure costs, or to reclaim space for continued disposal or any combination of these purposes. The separation of the waste component through material processing may be done to obtain some value from the excavated material.

Landfill mining has the potential to provide an alternative to the conventional closure. However, a poorly designed or operated mining or reclamation project can negatively impact the environment and the public with, for example, odor problems and other airborne contaminants, contaminated run-off, and release of waste into the soil or groundwater. The purpose of this regulation is to ensure that landfill mining projects are adequately analyzed during the permitting process regarding their suitability for mining and to establish the proper safeguards to prevent these types of adverse consequences to public health, safety and the environment. This proposed regulation strives to strike the appropriate balance between encouraging innovation and minimizing the potential for negative impacts

As stated in the 1995 Solid Waste Master Plan Update Massachusetts is committed to examining innovative technologies. One such technology is landfill mining, which has potential, but largely unproven, benefits. The Department is currently evaluting the environmental and economic impacts of landfill mining at two sites in the state: Newbury and Fairhaven, and has established an innovative technology policy for consideration of a limited number of other innovative proposals as well. While DEP is issuing these draft regulations for public comment, it has not completed its evaluation of landfill mining or determined that it is a viable technology. Rather, DEP's intent is to allow opportunity for public comment on what it views as necessary permitting and operational standards specifically for mining projects. Furthermore, the draft regulations will allow additional opportunity to interested parties to comment in general about this new technology. When DEP completes its evaluation of landfill mining demonstration and innovative technology projects it will re-evaluate the need for these permitting and operational standards and eliminate them from the regulations if landfill mining is determined not to be a viable technology.

Another major issue with landfill mining projects is whether or not the mining project will be used to create ne w landfill disposal capacity through the removal of previously disposed waste material and construction of a new lined area. With the exception of the projects DEP is currently evaluating at the Newbury and Fairhaven sites and innovative technology proposals reviewed and permitted under the innovative technology policy mentioned above, other landfill reclamation proposals that create new landfill capacity will need to be reviewed under the Capacity Allocation Process (CAP) regulations being proposed concurrently with these mining regulations. The CAP process will establish need for disposal capacity and review all proposed projects against a set of criteria to determine which project(s) is most suitable for meeting the state's needs for disposal capacity considering environmental, land use and other criteria.

How did the DEP develop these regulations?

DEP relied on input from a Landfill Mining Advisory Committee consisting of representatives from the Department of Public Health, environmental groups, municipal officials who are currently participants in a mining project or interested in mining, landfill operators, environmental consultants and mining proponents and personnel within the DEP.

The following section provides an overview of the proposed regulatory scheme for landfill mining operations.

What activities will be regulated?

The Department considers landfill mining to fall into one of the following three categories.
(a) Waste Relocation. Waste relocation simply involves the excavation of waste from one part of the landfill, usually the perimeter, for consolidation in a smaller footprint as part of closure activities. Waste is excavated and redeposited within the landfill footprint for the purpose of reducing the landfill footprint to reduce the size of the landfill requiring a final cap. This activity is not subject to the proposed regulations since no waste is being processed, but is regulated under 310 CMR 19.150 as part of routine closure activities.

(b) Waste Processing. Waste relocation with processing also involves the movement of waste from one part of the landfill to another for the purpose of closure, but includes the processing and separation of the mined materials for reuse. This type of operation is subject only to the operational requirements of section 310 CMR 19.122 of the proposed regulations and the Comprehensive Site Assessment (CSA) and Corrective Action Alternatives Analysis (CAAA)(310 CMR 19.150(6)) sections of the existing regulations. This activity does not include the recovery of air space for disposal of additional solid waste.

(c) Landfill Reclamation. This process consists of excavating a portion or all of a landfill through the mining and processing of materials to reclaim capacity for the disposal of additional solid waste. This type of activity must include upgrading the existing liner system to meet current regulatory standards. Reclamation is subject to the entire section of the regulations relating to landfill mining.

3. How Will Facilities Be Regulated?

The Department proposes that landfill mining projects include the following components:

(a) a Feasibility Study to determine the benefits and costs of conducting a landfill reclamation project including financial feasibility and institutional impediments. The Feasibility Study is essentially a three stage process.

1. through a process of literature research and limited site investigation the landfill is sufficiently characterized to determine if further field investigation is warranted. This stage is conducted solely by the proponent and does not require notice to or approval of the Department.

2. a Field Investigation Scope of Work is prepared for extensive site investigation. The Department will provide guidance defining the type and extent of invasive testing required as

part of the scope of work. A Field Investigation Scope of Work must be submitted to the Department for approval prior to conducting the activities specified in the scope of work.

3. a Feasibility Report containing all feasibility study information and results is submitted to the Department. The Department would have to approve the Feasibility Report prior to reviewing an operating plan.

(b) an Operating Plan which defines all aspects of the proposed operation. The Department must approve the plan before the proponent proceeds with the landfill mining operation.

III. Issues For Comment

The Department specifically seeks comment on the following issues:

(a) Reuse of Reclaimed Landfill Material. A significant consideration for deciding feasibility is determining the potential for reuse of Reclaimed Landfill Material (RLM) which consists of recovered cover soil and decomposed waste. The proponent must sufficiently characterize RLM to show it is suitable for its proposed use and that such use does not present a threat to public health, safety and the environment.

(b) Setback Distances. The Department views the setback criteria for landfill mining and reclamation in the following ways:

- Reclaimed capacity for future landfilling of solid waste is subject to the location and setback requirements at 310 CMR 19.038 (2)(a) and (c);

- Processing activities associated with landfill mining or reclamation are not necessarily subject to the setback distances at 310 CMR 19.038 since these activities, in particular excavation of a landfill, may be in areas which preceeded the establishment of the setback criteria. However, the proponents must show how site controls will prevent any threat to public health, safety, and the environment from excavation, processing, storage, removal, transfer, use, and disposal of excavated material. Use of any mined area for future disposal of solid wastes would have to meet the setback criteria as mentioned above.

(c) Economic Analysis. The Department proposes to require an economic analysis as part of the Feasibility Report. The purpose of the economic analysis is to show that a reclamation project is feasible as an alternative to capping the existing landfill and the project may be accomplished based on anticipated market conditions for recycled products and landfill air space. For example, if the proponent intends to sell all soils reclaimed as cover material to create capacity to provide funds for closure, then the economic analysis should identify markets and evaluate the feasibility of such a plan.

(d) Master Plan Status. The Department views reclaimed volume to be new capacity, therefore, mining projects which are intended to create capacity for disposal of new waste will be considered an expansion and subject to needs analysis if they propose to handle more than 50 tpd. The most recent Master Plan update indicates that landfill mining projects will be subject to the MSW moratorium. However, the Master Plan does leave the door open for opportunities for landfill mining projects which result in an effective remedial action and

facilitate capping at the site.

(e) Contingency Funds. The Department believes a strong potential exists for discovery of hazardous materials during excavation. Therefore, the Department proposes funds be set aside to ensure cleanup and disposal of any hazardous materials encountered on site. The proposed amount is: 1) twenty five thousand dollars ($25,000.00) per acre to be mined; or, one hundred thousand dollars ($100,000.00), whichever is greater. These funds are distinct from any other financial assurance mechanism currently required under 19.051 and are intended for hazardous waste clean-up and disposal only.

19.006 Definitions

Waste Processing means the excavation of a portion or all of a landfill to reduce the volume of material previously disposed and/or to reduce the landfill footprint. The reduction is achieved through the processing of excavated materials into recyclable, reusable and non-recoverable wastestreams.

Landfill Mining means the excavation of a portion of a landfill to relocate the waste or process the waste or reclaim the capacity of the landfill for future use, or any combination of these activities.

Landfill Reclamation means the excavation of a portion or all of a landfill to create new disposal capacity for disposal of waste generated off-site. This is achieved through the processing of materials into recyclable, reusable and non-recoverable wastestreams.

Reclaimed Landfill Material (RLM) means the soil like material typically consisting of a mixture of soil previously used for daily cover and decomposed solid waste which is recovered through screening operations. Depending on the chemical and physical characteristics of this material the RLM may be used onsite for daily cover and/or contouring material or other proposed uses as approved by the Department.

Waste Relocation means the excavation of a portion of the landfill to relocate solid waste within the footprint of the landfill for the purpose of reducing the cost of capping the landfill.

19.122 Landfill Mining and Reclamation

(1) Applicability.

(a) No person shall engage in waste processing or landfill reclamation activities except in accordance with the requirements of 310 CMR 19.122.

(b) Waste processing projects shall be subject to 310 CMR 19.122(3) and (4). Generally, processing activity takes place in coordination with construction of a landfill cap during landfill closure and/or remediation and generally is limited to a six month period or tied to an approved closure plan.

(c) Landfill reclamation projects shall be subject to all the provisions of 310 CMR 19.122, Landfill Mining and Reclamation. Activities identified below which are associated with landfill reclamation shall be subject to the regulations as follows:

1. Permit requests for an authorization to construct a liner in a reclaimed area shall comply with the requirements of 310 CMR 19.104, Landfill Facility Plan, and 19.041, Authorization to Construct.
2. Utilization of capacity created as a result of reclamation shall be subject to the permit review criteria at 310 CMR 19.038(2)(a),(c),(d).
3. Use of reclaimed landfill material (RLM) as cover material, except at the landfill where the RLM is generated, must comply with requirements at 310 CMR 19.130(15)(a) and (b), Cover Material.
4. Use of RLM for purposes other than cover material requires a beneficial use determination in accordance with 310 CMR 19.060.

(d) Waste relocation shall not be subject to the requirements of 310 CMR 19.122,

Landfill Mining and Reclamation, but is subject to the requirements at 310 CMR 19.130(32), Disruption of Landfilled Areas, and to DEP review of the facility's closure plans.

(2) Feasibility Evaluation.

(a) General. The purpose of the feasibility evaluation is for DEP to obtain sufficient site specific information to determine whether the proposed reclamation project is viable from a technical, regulatory and fiscal perspective. The feasibility evaluation shall contain:

1. the preliminary site investigation;
2. the field investigation; and,
3. the feasibility study report.

(b) Preliminary Site Investigation. A preliminary site investigation shall include a site inspection, personal interviews, review of landfill records, and review of site history. Such information shall be documented in a report submitted to DEP which shall include:

1. a plan for preliminary site inspection;
2. the vertical and horizontal extent of the landfill;
3. a vicinity plan or map that identifies potential environmental and human receptors within ½ mile of the landfill boundary;
4. the distance of the outermost limit of waste deposition to receptors or areas identified in 310 CMR 19.038(2)(c)5.;
5. sections, trenches, cells, berms, or other diversions forming discrete or partially separated areas of the landfill, or disposal areas for special wastes identified at 19.061 such as sludge, infectious waste, and asbestos waste and other non-msw wastes such as construction and demolition debris and incineration ash disposal areas;
6. the age, type of waste and cover material, landfill operation method, and estimate of volume for each area of the landfill identified in 19.122(2)(b)4., above;
7. available work space for equipment staging, material storage, and other work areas;
8. the landfill's existing groundwater monitoring system, procedures, and analytical data, existing landfill gas monitoring system and analytical results, including Comprehensive Site Assessment (CSA) data, if applicable, and surface water analytical results for the past twenty-four (24) months;
9. a description of any intrusive testing necessary to adequately address requirements of the preliminary site investigation, including, for example, investigation of the nature and extent of waste. Tests may include test pits, trenches, or test borings. The applicant must notify the Department at least 15 days prior to performing any intrusive tests as to the type and extent of proposed tests. Non-intrusive tests (seismic, ground penetrating radar, surveys, sampling, etc.) do not require prior notification to the Department;
10. the regulatory status of the landfill (e.g., permits, approvals and all amendments, results of department inspections, compliance history, notices of non-compliance or consent orders);
11. owner's or operator's reclamation goals.

(c) Field Investigation Scope of Work. A field investigation scope of work shall

describe all of the field work and laboratory analysis proposed for the Department to adequately determine the feasibility of a landfill reclamation project based on the reclamation goals. The field investigation scope of work shall require Department approval prior to commencement of the field investigation. The field investigation scope of work shall include:

1. identification of all proposed work areas;
2. a sampling plan which provides a rationale for the number and location of all borings, trenches, and test pits and their estimated depth and volume;
3. a description of all excavation, processing, and material handling operations;
4. chemical and physical characterization of the landfill sufficient to determine necessary site controls to prevent mining or reclamation activities from posing a threat to public health, safety, and the environment;
5. a description of all laboratory and field methods which will be used to characterize and quantify recyclable materials, combustibles, RLM, and other components;
6. a reuse plan for characterizing RLM intended for reuse which is sufficient to demonstrate the suitability for the intended use and the market for the material;
7. a delineation of project management responsibilities;
8. a project schedule, including time periods for each task; and,
9. a contingency plan as described at 310 CMR 19.122(5).

(d)Feasibility Report. Upon completion of the field investigation, the data shall be compiled and presented in a feasibility report and submitted to the Department. The report shall include:

1. a description of the results of the field investigation, including all items required in the field investigation scope of work;
2. the thickness of solid waste fill and depth to water table;
3. the water table depth throughout the area to be reclaimed;
4. a physical and quantitative characterization of excavated materials (e.g., recyclable materials, combustibles, RLM, and other components);
5. a preliminary evaluation of the suitability of the excavated material for reuse or recycling or need for further processing based upon its chemical characterization, or its expected final disposal location;
6. a determination of necessary site controls for the proposed reclamation project to prevent any threat to public health, safety, and the environment during excavation, processing, storage, removal, transfer, use, and disposal of excavated material;
7. a comparison of the proposed reclamation project's site characteristics relative to the Site Suitability Requirements noted in 310 CMR 16.40(3)(a) and 16.40(4)(a)-(f);
8. where the reclamation project is proposed as an alternative to the closure of the landfill, a financial analysis that considers, at a minimum, the following cost components:
    a. materials handling costs, including excavation, processing, analysis, and other material handling costs;
    b. construction of a liner which meets the standards at 19.100 et seq;
    c. all analytical testing including, for example, daily operational and reclaimed landfill material characterization;
    d. related engineering costs;

e. contingency for the disposal of any hazardous waste in accordance with 310 CMR 30.000;
f. disposal, marketing, or otherwise managing of all mined materials, including documentation of potential markets and market values for reclaimed materials;
g. operation and maintenance costs of the facility once new capacity is created;
h. capping and post closure costs for the reclaimed facility;
i. financial assurance mechanism for the reclaimed facility as described at 19.122(7);
j. total volume and tons of waste from off-site to be processed and/or disposed; and,
k. other costs, including, for example, fees to be paid to the municipality in which the landfill is located, or associated with the facility not covered by 310 CMR 19.122(2)(d)8.a.-j. above;

9. based upon the factors listed in 310 CMR 19.122(2)(d)8.a.-k., a base cost per ton shall be estimated to cover projected project costs. The proponent shall then make a determination as to whether it is financially feasible to undertake the landfill reclamation project. Such evaluation and determination shall be forwarded to the Department and the affected community along with the proponent's intention to undertake the reclamation project;
10. an evaluation of the potential impacts associated with landfill reclamation including potential pathways for nuisance conditions and off-site contamination, and methods for mitigating impacts associated with landfill reclamation;
11. a determination and recommendation to the Department as to whether landfill reclamation is feasible.

(e) Approval to Proceed. The Department shall review the Feasibility Study Report and recommendation on whether to proceed with the reclamation project. Where the Department determines that the project is technically and economically feasible it shall issue an approval to proceed to permit the project. Approval of the Feasibility Study Report does not constitute an approval of reclaimed material for reuse. Reuse of reclaimed landfill material shall be performed on a case by case basis and requires additional characterization based on the intended use.

(3) Operating Plan.

(a)Where the Department issues an Approval to Proceed as set forth at 19.122(2)(e), the applicant shall submit an operating plan which includes engineering drawings and written plans for the landfill reclamation or mining project which shall include the following:

1. a regional plan on a USGS quadrangle map that shows the area around the landfill to be reclaimed. All features noted at 310 CMR 16.40(3)(a), and at 310 CMR 16.40(4)(a), (c) and (d) shall be indicated, as applicable. In addition any airport runway within 10,000 feet shall be so indicated;
2. a vicinity plan or map that shows the area within 1000 feet of the waste deposition area to be reclaimed or waste handling area:
a. the names and addresses and approximate property lines of abutting property owners;

b.the location of the proposed reclamation;
c. the existing and proposed zoning and land use within that area;
d.any access roads; and other existing and proposed artificial or natural features relating to the reclamation of the landfill;
e.all features noted in 310 CMR 16.40(3)(a)1.-15., "Facility Specific Site Suitability Criteria" and in 310 CMR 16.40(4) subsections a, c & d; "General Site Suitability Criteria" as noted above shall be indicated as applicable;

3. a site plan in accordance with the criteria established in 310 CMR 19.104(2), "Landfill Site Plan";

4. the Engineering Plans of each phase of the proposed reclamation project which adequately delineate in plan and cross-sectional view, the depth of excavation, sequencing, proximity to liners, if any, or bottom of waste, other landfill structures and equipment, and direction of progression;

5. a landfill operation and maintenance manual in accordance with 310 CMR 19.104(5), excluding paragraph (5)(b). The Operation and Maintenance manual shall have a description of the excavation and sorting equipment, equipment capacity and procedures, including operation at the working face, each screening station or other equipment location, the location of each working area and distance to receptors or areas identified in 310 CMR 19.038(2)(c)5., and all proposed storage areas, including procedures for covering storage areas at the end of each day or placing them uncovered within a lined area within the landfill where all runoff is treated is collected;

6. a contingency plan in accordance with 19.122(5).

7. a health and safety plan;

8. a storm water management plan which must address discharge requirements required by local zoning and be in accordance with the state and federal storm water permit requirements, 314 CMR 3.00-6.00 and 40 CFR Part 122, respectively. The plan shall address operations, storage and processing areas in addition to the landfill area; and,

9. procedure for site clean-up and grading after reclamation, with detailed drawings showing original and final grades. Landfill footprint reduction must meet the requirements of 310 CMR 19.122(4).

(b) Training. The applicant shall identify worker training needs and the how they will be met. Minimum training shall include:

1. personal health and safety;
2. use of personal safety equipment;
3. identification of potential hazards such as recognizing hazardous waste or asbestos;
4. use of personal and environmental monitoring equipment; and,
5. contingency plan procedures.

(4) Landfill Footprint Reduction. If landfill mining results in a reduction of the landfill footprint, then areas from which wastes have been removed and that will not be accepting new wastes may need to be cleaned up in accordance with 310 CMR 19.150 and 19.151, as determined by the Department.

(5) Contingency Plans. Contingency plans shall include a description of the activities

necessary to respond to unexpected and potentially adverse events that may occur during field investigation and mining activities. Contingency plans shall address the actions to be taken to protect worker and public health and safety, and to protect the environment as result of events such as fires, explosions, major or sudden releases of landfill gases, odor problems, and the discovery of hazardous wastes, asbestos, or hazardous materials and shall contain:

(a) procedures for identifying, separating, handling and disposing of hazardous wastes and non-hazardous contaminated media.

(b) hazard evaluation and control including engineering measures, personal protection equipment, and air and water monitoring methods. The plan must also include designation of exclusion, decontamination and support zones, decontamination procedures, on site communications procedures and other emergency response procedures.

(c) designation of a site health and safety coordinator on a full time basis during excavation and processing operations. The coordinator must be trained in hazardous waste and emergency response procedures.

(d) a plan for training all workers on how to recognize contingency events as well as how to respond to them.

(6) Contingency Fund.

(a) Should hazardous materials be encountered during mining or reclamation activities which require special handling and disposal off-site, then the owner and/or operator shall transport and dispose of those hazardous materials in accordance with 310 CMR 30.000 or other applicable regulations. In order to ensure that sufficient funds are available for such transport and disposal, the owner and/or operator shall maintain a cash contingency fund in the amount of:

1. twenty five thousand dollars ($25,000.00) per acre to be mined; or,
2. one hundred thousand dollars ($100,000.00), whichever is greater.

(b) Such funds shall be segregated from all other operating or capital funds in a separate bank account and shall be spent only for activities relating to transport and disposal of hazardous materials or wastes encountered during mining or reclamation activities. Such account and amount shall be certified and information forwarded to the Department by February 1st of each year. Upon completion of the project the permittee may request and the Department shall grant a release of the funds in such account.

(7) Financial Assurance for Corrective Action, Closure and Post-Closure. The permittee shall maintain a financial assurance mechanism, separate and distinct from the Contingency Fund required at 310 CMR 19.122(6), in accordance with the financial assurance requirements set forth at 310 CMR 19.051.

(8) Review Procedures. Landfill reclamation and mining applications shall be subject to the following review procedures:

(a) The Field Investigation Scope of Work and the Feasibility Study Report shall each be reviewed as a minor permit modification in accordance with 310 CMR 19.037. The applicable review criteria shall be 310 CMR 19.038(2)(a)1.-10.;

(b) The Feasibility Study Report and Landfill Mining Operating Work Plan shall each be reviewed as a major permit modification in accordance with 310 CMR

19.037. The applicable review criteria shall be 310 CMR 19.038(2)(a)1.-10.
(c) Activities subject to 19.122(1)(b) and 19.122(1)(d) above will be reviewed as part of the landfill assessment requirements and corrective action design pursuant to 310 CMR 19.150 and 310 CMR 19.151.